

Net Zero Homes

Benefits, Challenges, Considerations

April 20, 2023

Rendition of Planned Home



Melillo Architecture - Brielle, NJ



General Information

Goal: All Electric Consumption

Intended Sea Bright Permanent Home and For Guests

4,300 sq ft livable space

Ground floor 3 car garage and storage

1st - three bedrooms; office/gym; family room

2nd - primary; kitchen, dining; family room; mstr bedrm

3rd - half indoor recreation; half outdoor recreation

Disclaimer: Presenter Homeowner; Not a builder; Not an engineer; Not an electrician

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INSTALL CLOSED CELL INSULATION IN AREAS AS SHOWN:

CEILING/ RAFTERS- R-30

2" x 6" WALLS- R-19

OVERHANGING FLOOR JOISTS- R-30

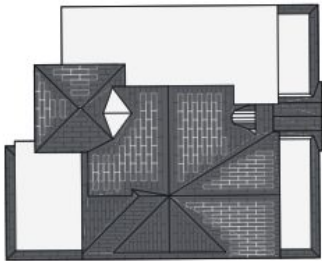
FIRST FLOOR- R-30

INSTALL SUPPLEMENTAL R-11 BATT INSULATION IN ALL EXTERIOR WALLS.

Tesla Roof + Battery

10.7kw Solar Roof + four 13.5kw Powerwalls

Aerial Design of Roof
Solar Tiles Placement White
Outline



Front of House

Tesla Cost without Fed credits \$63k
 Tesla Cost with Fed Credits \$44k
 Traditional Roof+Generator ~\$35k
 Tesla Cost above Traditional \$8k one-time increase
 Avoids \$3kyr elec.+\$3kyr gas \$6k annual benefit
 20 year savings @ \$6k year \$120k

Pricing Details

Solar Roof ⓘ	\$40,267.03
4 Powerwalls ⓘ	\$33,000.00
Installation Cost	Included
Solar Renewable Energy Credit ⓘ	-\$6,973.20
Install Solar Roof + Powerwall together	-\$3,000.00
Deposit	-\$100.00
Total Amount Due	\$63,193.83
Federal Tax Credit ⓘ	-\$18,988.15
Net Cost	\$44,305.68

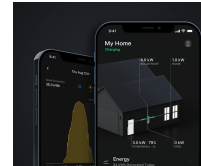
	Cash	Loan
Solar Roof ⓘ		\$40,267.03
4 Powerwalls ⓘ		\$33,000.00
Installation Cost		Included
Solar Renewable Energy Credit ⓘ		-\$6,973.20
Install Solar Roof + Powerwall together		-\$3,000.00
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Total Amount Due		\$63,193.83
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Powerwall Specs

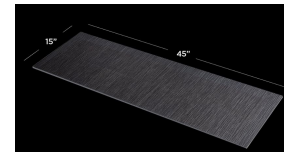
Powerwall+	Powerwall
Energy Capacity 13.5 kWh*	Inverter Efficiency 97.5% Maximum Power Point Trackers: 4
On-Grid Power 7.6kVA / 5.8kVA continuous†	Solar Input
Backup Power 9.6kW / 7kW continuous* 22kW / 10kW peak* 118A max LRA start Seamless backup transition	Installation Integrated inverter and system controller -4°F to 122°F Water and dust resistance
Size and Weight L x W x D 62.8 in x 29.7 in x 6.3 in 343.9 lbs	Certifications Meets North American safety and EMI standards
	Warranty 10 years

*See Powerwall Technical Specifications for more details.
 †Full sun / no sun.



Solar Roof Specs

Tile and Power Warranty 25 years	Fire Rating Class A (highest rating)
Solar Glass Tiles 72 W	Hail Rating Class 3
Steel Tiles Corrosion and weather resistant	Roof Pitch ≥ 2:12
Wind Rating Class F (highest rating)	



Tesla Roof / Tesla Batteries Benefits

Tesla has innovative leadership supported by strong research and development - continual technology improvements; software managed app

Off-grid

Cost - leveraging solar/battery saves money; products purchases are moderately higher than traditional; may reduce build costs

Quietness - electric products typically are quieter

Batteries - act as backup generator and night usage; warranty 70% after 10 years; no noise; clean burning; nice looking

Roof - combined glass and metal; produces no asphalt run off in the water system; 25 year warranty but should last much longer; 124mph wind rated; 192mph (internal doc)

Health - eliminates carbon dioxide and other burning pollutants in your home - fireplaces, furnace, range, hot water heater

Allows cost effective leveraging of:

Electric cars

Induction ranges (electric) - produces less heat; no burning chemicals

VRF HVAC Hyper Heat (electric) - limited external venting; more zones

Electric fireplaces - limited external venting; simpler install

Electric Continuous Hot

Electric Dryers

Electric radiant floors

All Items Electric - Lots of Energy Consumption

Multiple electric cars - 2 or more - 40amps per car

Induction Cooking Ranges - 50amps

Electric Continuous Hot Water - 100+ amps

Electric Fireplaces - 110 vs 240

Electric Radiant Floors - depends on sq ft

Electric VRFs with Hyper Heat Pumps - more amperage

Jacuzzi + Pool - even more amperage

What about using outdoor Induction BBQs??

Heat only needed in the winter and A/C only need in summer. So it should balance. Right?!

Electrification Challenges

Soft Issues:

- Educating yourself
- Few to Confer with Complete Experience
- Deciphering What is Fact vs Fiction
- Winning Over Family, Friends, Architects, Engineers, Builders, Town, Utilities
- Educating Others with how it can work

Hard Issues:

- Aesthetics vs Performance vs Cost - Roof, Fireplaces, BBQ, Floors, VRFs
- Determining actual usage requirements
- Maximizing solar production - # of Roof Peaks Limits Solar; Battery Placement
- Obtaining enough amperage from utility - Is 400amp enough
- Selecting the 'right' equipment (instant hot, dryers, induction range, fireplaces)
- Solar company communication, installation and support
- Other stuff: Lightning Rods Not Supported with Tesla roof
- Controlling costs